

Redwood

National and State Parks

National Park Service
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State of California

2014 HERD UNIT CLASSIFICATION and MANAGEMENT OF ROOSEVELT ELK



Photo: Redwood National and State Parks

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INTRODUCTION

The Roosevelt elk (*Cervus elaphus roosevelti*), the largest of the six recognized subspecies of elk, once occurred from southern British Columbia south to Sonoma County, California. The tribes living in and around what is now Redwood National and State Parks (RNSP or “parks”), the Tolowa, Yurok, Hupa, and Chilula, burned the prairies of the Bald Hills and other forest openings regularly in part to promote the growth of new grass attractive to elk and deer; their use of elk for subsistence presumably had minimal impact on elk populations. With the arrival of European and other foreign settlers intense hunting began in the mid-1800s and the Roosevelt elk’s range was highly reduced. In 1848 through 1855, market hunting for elk hide and meat supplied gold miners during the northern California gold rush. When the gold rush was over a large amount of elk habitat was converted to cattle and sheep ranching and croplands, and elk were killed to protect against crop depredation. Elk populations and distribution in the Marble and Siskiyou Mountains and the Salmon-Trinity Alps were significantly reduced (USDI 1983). The only Roosevelt elk populations that persisted through this period were those occupying coastal lowlands in northern California, where dense forests and brush fields provided protective cover. Today Roosevelt elk in California persist only in Humboldt and Del Norte Counties, and extreme western Siskiyou County.

The Redwood National Park 1986 *Elk Management Report* (Hofstra *et al.* 1986) stated the long term goal for elk within what is Redwood National and State Parks is “...an elk population in equilibrium with the environment, regulated by vegetation dynamics, predation, competition with other species, and other natural forces.” It goes on to acknowledge that achieving this goal may be “problematic at Redwood, given its configuration, relatively small size, land use history, adjacent activities, and habitat needs of elk.”

Work in RNSP

Annual classification of elk herds within RNSP began in 1996 to document relative abundance and simple population characteristics, such as cow numbers, recruitment, and calf survival within known herds (Wallen 1997). These herd count/classifications have been conducted annually each fall since that time by parks staff and others. Also in 1996, a monitoring program of the elk population in the Prairie Creek drainage was established independent of the RNSP program (Weckerly 1996, Weckerly *et al.* 2004). The 2 independent monitoring programs in the same area provided a unique opportunity to compare data gathered unsystematically with data gathered using a science-based approach with a standardized protocol.

Beginning in 2004, elk in the Bald Hills were counted by Dr. Floyd Weckerly using a method he developed (Weckerly and Francis 2004). Unlike the Prairie Creek herd counts, which tend to yield similar results using the parks’ and Weckerly’s survey methods, the Bald Hills herd counts tended to be quite dissimilar between parks staff and Weckerly, with staff counts consistently undercounting the number of animals. Due to

the inaccuracy of the park staff counts, those counts in the Bald Hills were discontinued in 2008.

METHODS

Although 7 separate herds have been counted/classified within RNSP in recent years, due to staffing constraints only 6 of the herds were counted in 2014. Five herds were counted by RNSP staff between September and mid-November in 2014, referred to collectively as the “coastal” herds. The Bald Hills herd was counted 10 times in January 2015 by Dr. Weckerly. Surveys by Dr. Weckerly associated with Prairie Creek herd monitoring also were conducted in January. Results from these latter two surveys are considered part of the 2014 elk count “season” and are included in this report with the fall 2014 information. This is compatible with how survey results have been reported in previous reports. The 7 fall count herd units are (including the herd not counted in 2014):

- (1) **Old South Operations Center (OSOC)** herd
- (2) **Lower Redwood Creek (LRCR)** herd (sometimes referred to as the “Levee” herd in previous reports)
- (3) **Davison Ranch (DARA)** herd
- (4) **Elk Prairie/Hwy 101 Bypass** herd (EPBY)
- (5) **Gold Bluffs Beach (GOBB)** herd (several co-mingling groups)
- (6) **Crescent Beach Education Center (CBEC)** herd
- (7) **Bald Hills (BAHI)** herd

Classification counts were conducted by RNSP staff driving or hiking to the identified herd units. Using binoculars and spotting scopes, staff recorded the total number of elk observed, and the total number of elk within each classification group. The groups are mature bulls, spikes (first year males identified by a lack of brow tine off the main beam), cows, and calves. The observers assigned ranking criteria to the classification counts that specified the accuracy of the count, using a scale of 1 to 4. A rating of 1 indicated good visibility and the animals were close enough to accurately count and classify the herd. A rating of 4 indicated that the observation was unacceptable for determining herd composition because of poor visibility due to low light level, fog, vegetation, or topography. In calculating the ratio of calves to adult cows, ratings of 3 and 4 were dismissed due to poor quality of observations. As in previous years, the highest cow counts with a favorable ranking were used as the herd size estimates for 2014. The counts from the fall period were used, even though more animals may have been observed during earlier months.

Fall Count Herd Classification Groups

- **Cows** = all females >1 year old.
- **Calves** = young of the year <1 year old (recognized by spotted coat and small size; later the spots disappear, but they retain a short, rounded snout).
- **Spikes** = year old males exhibiting only a main beam, brow tine absent.
- **Mature bulls** = males ≥ 2 years, with brow tine evident off the main beam.

Fall Count Herd Observation Ranking Criteria

- 1 = Good**, visibility good and animals close enough to observe with high confidence of an accurate count and classification.
- 2 = Fair**, animals are either distant or not fully cooperative for good confidence in classification (e.g. some vegetation blocking full view or movement into cover while counting).
- 3 = Poor**, animals too far away (e.g. difficult to track individuals or animals are in adjacent hiding cover).
- 4 = Unacceptable**, bad visibility due to low light levels, fog, uncooperative animals.

Elk in the Bald Hills during January surveys were counted from vantage points or approached on foot. A set route was driven/walked on 10 different days. When elk groups were approached on foot it was to obtain an unobstructed view or to conduct a coordinated stalk. A coordinated stalk consisted of an attempt to alert elk groups to the presence of one surveyor in such a manner that the group moved to an area with an unobstructed view where they could be counted by another surveyor. All elk observed were counted and classified as either mature bulls or “cows” using binoculars and field telescopes. In most previous years calves and spikes were combined with female counts (the “cow” count) due to the large size of the herd, however, this year classification of the herd into the 4 disparate age groups was possible. All animals within 50 m (~165 ft) of one another displaying coordinated activity or movement were considered a group (Weckerly *et al.* 2004). As with the other herd counts, the highest reliable cow count was used for the year’s herd size estimate.

RESULTS AND DISCUSSION

Fall classification counts (and January 2015 for Bald Hills) for the different age classes are presented in Table 1. It should be noted that the parks’ DARA and EPBY herds are combined in Weckerly’s “Prairie Creek” herd. Table 1 numbers for DARA/EPBY reflect fall staff counts.

Table 1. Highest number of elk reported within each herd unit and for each classification grouping in 2014. MB = mature bull, SP = spike, CW = cow, CV = calf, n = total fall counts when animals were observed.

Location	MB	SP	CW	CV	Total	n
OSOC	1	0	19	6	26	4
LRCR	3	6	21	6	36	6
BAHI	4	19	188	58	269	10
DARA	1	2	29	11	43	8
EPBY	4	1	3	3	11	8
GOBB	0*	0	15	8	23	3
CBEC	-	-	-	-	-	0

* High bull count during the fall for GOBB was 3; bulls not with a cow herd.

Weckerly's January 2015 estimate for the DARA herd (including animals in Boyes Prairie or EPBY) was 54 elk (F. Weckerly pers. comm.). The staff count for the DARA/EPBY herds combined also was 54, indicating once again that count numbers of these herds between RNSP staff and Weckerly are comparable.

Cow counts by year, the best indicator of herd persistence (McCullough *et al.* 1994, Weckerly and Francis 2004), are displayed in Fig. 1. Cow numbers for all herds for all years are provided in Appendix A. Three coastal herds showed increases in cow numbers over last year's numbers, and 2 herds had fewer cows counted. There were 3 cows observed in the EPBY herd, one fewer than in 2013; all 3 cows had calves that were still present during the fall count period. No cows were recorded in the EPBY herd in the January counts (F. Weckerly pers. comm.). The GOBB herd normally ranges widely over a large area and is difficult to count; this year's count was down substantially from last year's (15 versus 25), and was the lowest recorded since 2010.

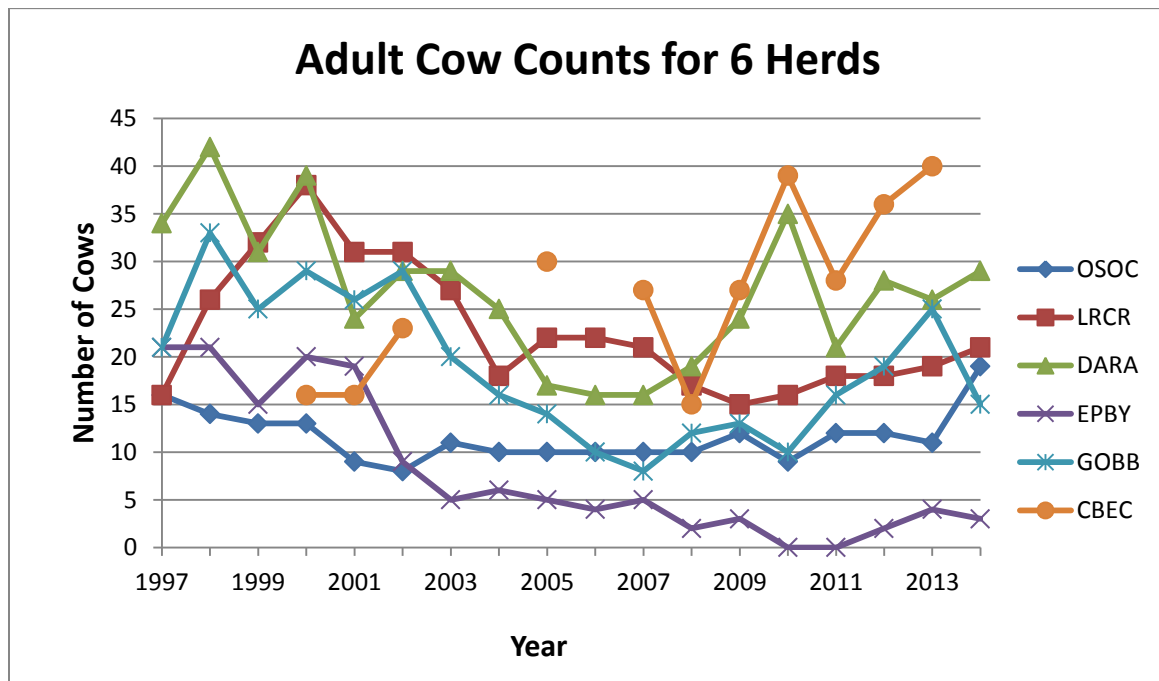


Figure 1. RNSP fall elk herd cow numbers from 1997 to 2014 indicating herd persistence through time. The CBEC herd counts did not begin with regularity until 2007; this herd was not counted in 2014.

The highest fall cow count in each herd was used to determine calf:cow and bull:cow ratios. The ratio of calves to cows is an indication of herd productivity; ratios were up from last year's counts in 2 herds and down in 3 of the 5 herds counted in fall months (Table 2). The high calf:cow ratios in the EPBY herd in the last 3 years (2012-2014) and some other previous years are artifacts of an extremely small population size. The calf:cow ratio in Weckerly's "Prairie Creek" herd was 0.43 in January 2015 (Weckerly unpub. data). The fall staff counts indicated a calf:cow ratio of 0.44, when the EPBY and

DARA herds were combined. In 2014, staff counted 14 calves in the 2 herds combined; Weckerly's count was 13.

This year Weckerly (unpub. data) was able to calculate calf:cow ratios for the Bald Hills herd. This is only possible when conditions for counting are optimal, e.g., the herd is in clear view and staying fairly still. The calf:cow ratio for this herd was 0.31 in 2015.

Table 2. Calves per 100 cows for coastal elk herd counts, 2003 to 2014 (N/A = data not available).

Herd	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
OSOC	27	10	40	30	40	40	25	55	16	8	45	32
LRCR	11	22	18	45	33	23	20	56	44	61	58	29
DARA	21	24	12	18	56	37	33	22	38	18	42	38
EPBY	20	50	0	25	60	100	33	0	0	50	50	100
GOBB	15	6	17	30	50	50	54	60	44	53	20	53
CBEC	N/A	N/A	N/A	N/A	30	40	30	5	14	28	20	N/A

One reason for monitoring bull:cow ratios is that these ratios may indicate the quantity of available forage. When food is less abundant males may use forested habitats more frequently, making direct observation difficult (Weckerly *et al.* 2004, Weckerly 2007). Figure 2 displays the bull:cow ratios for the 5 herds monitored by park staff in the fall of 2014. Weckerly reported a bull:cow ratio of 0.23 for his "Prairie Creek" herd. The staff count ratio for the EPBY and DARA herds combined was lower, at 0.16. Bull:cow ratios were lower than last year for 3 of the 4 coastal herds when bulls were present with cows. The bull:cow ratio for the GOBB herd was 0 due to no bulls present during the high cow count. The bull:cow ratio doubled in the EPBY herd over last year. The BAH1 herd bull:cow ratio was not calculated due to the potential for some bulls in this herd to go undetected in January (F. Weckerly pers. comm.).

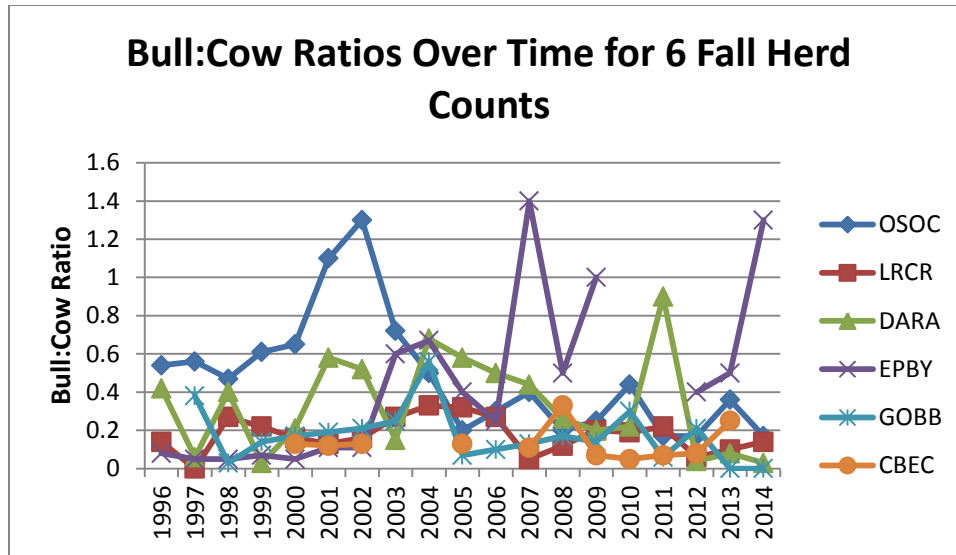


Figure 2. Bull:cow ratios from 1996 to 2014 indicating herd reproductive capability through time. The CBEC herd was not counted consistently every year and was not counted in 2014.

Herd Summaries

Old South Operations Center (OSOC) and Lower Redwood Creek (LRCR) Herds

The cow count for the OSOC herd was the highest it's been since herd classification began in 1997 and in fact the total herd count was the highest of record. It's believed that the LRCR herd splintered with some animals joining the OSOC herd, thereby raising the number in the OSOC herd to 26 in 2014 compared to 17 in 2013. Calf production was good, with 6 calves persisting into the fall this year; 5 calves were present in fall of 2013. The number of bulls observed was half of the number observed last year, down from 4 to 2.

The LRCR herd uses a long corridor of habitat along lower Redwood Creek extending from the beaches and private land pastures near the Redwood Creek estuary, upstream to the Tall Trees Grove. On the same day- October 8- 36 animals were counted in the herd near the Orick Rodeo Grounds and 26 animals were counted in the OSOC herd in private land south of Highway 101. By late winter/early spring of 2015 these 2 herds had completely joined with over 50 animals noted in a group in the same private pastureland. The LRCR cow count was slightly higher than in the previous 3 years at 21 animals, and the highest it's been since 2007 when 21 cows were counted. The calf:cow ratio was reduced by half from 2013 with only 6 calves surviving until fall, and was the lowest it's been since 2009 when the ratio was 0.20. The bull:cow ratio was up slightly from last year's and twice what it was in 2012.

Davison Ranch (DARA) Herd

This herd consists of a group of mature bulls that often occupies the northern portion of Elk Meadow north to the Lost Man Creek Fish Hatchery, and a group of cows, spikes, and calves that occupies the southern portion of Elk Meadow south to Skunk Cabbage Creek. These animals also frequent the Redwood Adventures Lodge area and the lawn of the Valley Green Office (Green Diamond Resource Co.) on the east side of Highway 101. The number of cows counted (29) was up from last year's and exceeded by one the previous 10-year high of 28, but was still far lower than the 42 and 39 cows counted in 1998 and 2000, respectively. The calf:cow ratio was down to 0.38 from 0.42 in 2013. The bull:cow ratio was the lowest on record, at 0.03, however Weckerly reported a bull:cow ratio of 0.23 in January.

Elk Prairie / Hwy 101 Bypass (EPBY) Herd

In 2014, throughout the year 6-7 bulls were observed within Elk Prairie (= Boyes Prairie) and 3 cows were present, each with a calf resulting in a calf:cow ratio of 1.0. The number of bulls was down from the 9-10 bulls present in Elk Prairie throughout 2013.

Gold Bluff Beach (GOBB) Herd

The GOBB herd is comprised of several sub-herds that come together on occasion. They use a large area that extends from Mussel Point at the south end of Gold Bluffs Beach to Carruther's Cove near the northern limit of this beach, a distance of 12 miles. They also on occasion leave the beach area; this year during the fall count period at least part of the herd was observed at the northern end of Newton B. Drury Parkway. This year 3 fall counts were attempted. The high cow count yielded 15 animals (at Newton Drury Parkway), at which time no spikes or bulls were observed. During one count 12 cows, 8 calves, and 1 bull were observed at Ossagon (Gold Bluffs Beach). The remaining count was of 3 bulls only, 2 near the Gold Bluffs Beach entrance kiosk, and one near Fern Canyon. This herd is difficult to count because of the large area the animals use and the brushy nature of the coastal bluffs which can obscure individuals. Due to these factors it is likely the counts under-represent the total herd number to some degree. The calf:cow ratio was back up from 0.20 in 2013, to 0.53, with 8 cows observed. The bull:cow ratio was zero for the second year due to no bulls observed with the cow herd during fall counts. On October 2, 21 animals including cows and 1 bull charged visitors along trails in Prairie Creek Redwoods State Park (PCRSP; see "Incidents" section below).

Crescent Beach Education Center (CBEC) Herd

This herd was not counted in 2014 due to lack of staffing at the facility.

Bald Hills (BAHI) Herd

There were 10 counts in the Bald Hills in 2015, from January 6 to January 21. This year the high count for the BAHI herd was 269, an increase over the 240 elk counted in 2013. The cow group was observed on the Stover Ranch, immediately adjacent to the park, during the first 3 surveys after which the group moved to the park. The highest bull

count this year was 6. This year herd classification was possible; the high count included 188 cows, 58 calves, 19 spikes, and 4 bulls. The calf:cow ratio was 0.31, up from last year's ratio of 0.13. This year the BAH herd splintered into 2 subgroups, the smaller of which was observed west of Lyons Ranch, with the larger group observed east of Maneze Prairie.

Winter survey routes in the Bald Hills were displayed in previous Annual Elk Reports (through 2008).

Other Observations

There were 9 opportunistic staff or visitor observations of elk recorded in the parks' Wildlife Observation database in 2014, including one record of tracks only. In February, 2 elk calves were observed at the Tall Trees Access Road gate at the junction with Bald Hills Road. In March, June, and September there were 5 observations of elk in the vicinity of the Tall Trees Grove or along Tall Trees Trail.

Incidents

Calving Season

Although specifics are lacking, there were "steady" reports by visitors to the Prairie Creek Visitor Center staff of aggressive cow elk in the Gold Bluffs Beach area throughout the post-calving summer months. There were no injuries or major incidents reported other than that of one couple who were treed by a cow multiple times near Fern Canyon sometime in late June or early July.

On June 6, a small group of cows trapped visitors near trees along the Coastal Trail north of its junction with Fern Canyon. They called 911 and were rescued by law enforcement rangers. This area is a known calving area with reports of aggressive elk behavior annually (see "Elk Calving Areas" below).

On July 1, two visitors were hiking on the Elk Prairie Trail, on the east side of Newton B. Drury Parkway opposite the campground. A cow elk charged twice while the people yelled, waved arms, and backed away.

Rut

Unlike the previous 2 years there was much less bull-with-harem activity reported by people on trails in the forest in PCRSP. However, there were a couple reported instances of bulls riled up.

On September 16, a bull- apparently unprovoked- "intimidated" a visitor next to the Prairie Creek Visitor Center, lunging toward him or her and advancing toward the person as he or she was backing up. The visitor eventually had to leave the area.

On October 3, park law enforcement received notice that a bull was charging at hikers near the Zig Zag 2 Trail and Prairie Creek Trail junction, forcing them to turn back. The bull entered Newton B. Drury Parkway and charged a ranger's patrol vehicle.

Entanglements

There was only one observation of antler entanglement in the parks in 2014. In December a spike in the OSOC herd picked up landscaping cloth with one of its antlers. The cloth would occasionally flop down over its eyes causing it to run wildly around a group of approximately 50 animals. This caused the cow group to become nervous and the bull to eye the spike intently. The material eventually fell off without human intervention.

Mortality/Injury

There were 3 known elk deaths (from other than hunting) in RNSP in 2014 that included 1 bull, 1 cow, and 1 unknown sex.

In May, an adult cow was found dead near the eastern park boundary in the Bald Hills. There was no apparent indication as to cause of death. In June, park law enforcement reported a case of probable poaching. An elk was dragged behind a vehicle and was butchered in one of the Bald Hills Prairies. In November, a wildlife crew working in the forest just south of the PCRSP/NPS boundary found a freshly dead 5-point bull adjacent to a hiking trail. The animal appeared to have been in good health when it died but may have had an ankle injury on one of its hind legs.

There were 2 observations of injured animals in 2014. In August, the alpha bull (9 pt x 9 pt) from the OSOC herd was observed on more than one occasion limping/dragging a front hoof that was "hanging as if broken". In October, a cow from the GOBB herd was seen with an injury to the face/jaw area. The suspected cause of the injury was a bull's antlers.

Annual Elk Hunts

Three local elk hunts may impact RNSP elk herds. The Klamath Hunt takes place on Green Diamond Resource Company lands adjacent to the parks, and may take animals from the Bald Hills herd and possibly the GOBB herd. In 2014, California Department of Fish and Wildlife (CDFW) issued 5 bull tags for this hunt. According to CDFW 2014 hunt statistics, 1 bull was taken from the Williams Ridge area, just outside the national park in the Bald Hills.

Stover Ranch, which borders the park to the east in the Bald Hills, was issued 4 bull and 2 antlerless tags under the Private Lands Management Program. It is unknown how many of these tags were successful, but it is possible that the Bald Hills elk herd residing in the park could have been impacted by this hunt.

The Northwestern Hunt is on all lands in Del Norte and Humboldt Counties that are not Green Diamond Resource Company or park lands. The Northwestern Hunt may cause hunting pressure in the Orick Valley (OSOC, LRCR herds) and in the north (e.g., CBEC herd). There were 30 either-sex tags issued in 2014. According to CDFW 2014 hunt statistics, 25 animals were taken, however it is not known precisely how many, if any, elk were taken from the Orick Valley. Based on previous years' hunter success it is possible that some proportion of the animals taken included elk from one or more park herds.

A Note Regarding Bull:Cow Ratios

Weckerly (pers. comm.) reported in 2015 that the size of bull groups in the Prairie Creek drainage of the parks has been declining during recent years. Also in recent years there has been a lack of sexual segregation among bulls and cows with bulls randomly associating with cow herds. There can be a difference in forage resource use between cows and bulls; cows tend to use meadows more frequently than bulls which tend to forage within forested habitats, especially when meadow forage is limited (Weckerly pers. comm.). The low number of bulls along with their potential use of forested habitats makes it difficult to obtain accurate estimates of bull numbers.

We will continue to count bulls during the herd classification period, however, in the future bull:cow ratios will not be calculated/reported.

Calving Areas within RNSP

Since 2008 park staff have recorded instances of aggressive cow elk behavior during the calving season. Areas heavily used as calving grounds within RNSP, also coinciding with high visitor use areas, include grassy areas from the Fern Canyon parking lot north along the Coastal Trail to at least the West Ridge Trail junction; Gold Bluffs Beach Road from the picnic area to Fern Canyon parking lot; and Endert's Beach Road near the Crescent Beach Education Center.

Report Prepared by Kristin Schmidt, RNSP Wildlife Biologist

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PERSONAL COMMUNICATION

Dr. Floyd "Butch" Weckerly, Professor, Texas State University, San Marcos, TX

Appendix A

Highest reliable (ranking <3) cow counts for identified elk herds, 1997 to 2014 (data displayed, in part, in Figure 1 in the report). ND = no data available for that year.

Location	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
OSOC	16	14	13	13	9	8	11	10	10	10	10	10	12	9	12	12	11	19
LRCR	16	26	32	38	31	31	27	18	22	22	21	17	15	16	18	18	19	21
BAHI	45	98	62	104	54	35	26	241*	251*	278*	270*	244*	261*	225*	241*	242*	240*	265*
DARA	34	42	31	39	24	29	29	25	17	16	16	19	15	23	21	28	26	29
EPBY	21	21	15	20	19	9	5	6	5	4	5	2	3	0	0	2	4	3
GOBB	21	33	25	29	26	29	20	16	14	10	8	12	13	10	16	19	25	15
CBEC	ND	ND	ND	16	ND	23	ND	ND	30	ND	27	15	27	39	28	36	40	ND

* Counts conducted by Weckerly account for differences in herd counts beginning in 2004. Note that these “cow” counts represent cow, calf and spike groups.